

There can be no doubt that the greatest destruction occurred at the city of West Point, which is situated at the point where the Chattahoochee River begins to form the boundary between Georgia and Alabama. This is a thriving city of cotton mills and manufacturing plants, the business part of the city and many residences being built on the low ground near the river banks between the hills on the eastern and western banks of the river. At a stage of 22 feet the water enters the streets of the city; the sidewalks and stores are elevated above the streets proper some 3 or 4 feet. This place having experienced a rise to 25.6 feet in 1886 and again to 25 feet in December, 1901, merchants are prepared to elevate their goods to higher positions in the stores when floods are threatened. The river, however, on this occasion rose with such rapidity and reached such an unprecedented stage that in many cases the precautions taken were of no avail. The crest reached at West Point was 29.3 feet on the afternoon of December 10.

The entire business section of West Point was flooded. Manufacturing establishments, hotels, the Auditorium, churches, warehouses, general stores, and numerous residences were surrounded by a swiftly moving current of water from 5 to 10 feet deep. There was no loss of life, but several hundred people were marooned for some days. The highway bridge over the Chattahoochee which connects the two sides of the city and supported the big water main was carried away, so that the city was without drinking water. The telephone and electric-light systems, gas works, and street-car service were entirely put out of commission, entailing great loss to equipments. The loss of property as a whole, though not yet accurately fixed, is conservatively estimated to have exceeded a million dollars. For some days following the flood the distress at West Point was so great that Red Cross aid from Atlanta was rushed to the city and contributions of money poured in from neighboring cities.

The Chattahoochee at Columbus rose to the very high stage of 52 feet, surpassing the record of 1886 by 3.5 feet. A great deal of damage was done to the machinery and stock of the cotton mills, iron foundries, grocery stores, and other commercial concerns along the river front. Electric light and street car service were suspended, and gas for cooking could not be obtained for some days. At Girard across the river in Alabama poorer people living in lowlands near the river had to vacate their homes. There was much enforced idleness owing to the impossibility of operating the mills.

Another feature of the flood was the enormous loss of river and smaller county bridges in at least a dozen counties within the region of greatest precipitation. The following counties suffered most severely: Fulton, Cobb, DeKalb, Rockdale, Spalding, Hall, and numerous others. On the night of December 9 while endeavoring to cross Utoy Creek near Atlanta an automobile was precipitated into the flooded creek, and three persons were drowned. The loss to crops gathered or prospective was very small, and to railroad property not great. An estimate of the total loss, including loss to buildings, factories, municipal plants, highways, and bridges, may conservatively be placed at nearly \$2,000,000.

FLOODS IN THE MERIDIAN, MISS., RIVER DISTRICT, DECEMBER, 1919.

By J. H. JAQUA, Observer.

From December 8 to 9, 1919, more than 10 inches of rain fell over a narrow strip of territory in Mississippi, averaging approximately 50 miles in width, and extending northeastward from Lincoln County, in the southern portion of the State, to Kemper County, in the east-central portion, a distance of about 150 miles. The greatest depth of rainfall, somewhat over 12 inches, was in Lincoln and Lawrence Counties. To the northward and to the southward of the 10-inch area, the isohyets decrease rapidly to less than 4 inches. As the principal tributaries of the Chickasawhay, the Leaf, and lower Pearl Rivers originate in the region covered by excessive rains, the rise was extraordinary and unusually destructive in the upper watersheds of those streams.

The rise in the two uppermost reaches of the Chickasawhay River, Sowashee Creek and Chunky Creek, was the greatest of record. According to reliable marks, the overflow of Sowashee Creek, at Meridian, on the 8th-9th, was about 16 inches above any previous known mark, but southward from Meridian and from Chunky, on Chunky Creek, the crest stages were progressively lower than in the record flood of April, 1900. The stages in the upper Chickasawhay were from 8 to 12 inches below the

heights reached in April, 1900, and were generally slightly lower than the stages reached in May, 1909.

Sowashee Creek, which is usually an insignificant stream, became, on the night of the 8th, a raging river of no mean proportions, threatening destruction to a large area in Meridian and its suburbs. The lower levels of the city and the districts to the southward were inundated until noon of the 9th. In this district it was necessary to transport hundreds of Negroes to higher ground, many of the victims being awakened by rescuers when the rising waters had already entered their dwellings. One person was drowned in rescue work.

The losses to individuals were not large in the aggregate, but many of the poorer families lost their hogs, chickens, and, in a few instances, their household effects.

All railroads in Lauderdale County suffered heavily by washouts, suspending traffic for two days. Many county bridges were washed out, and the damage to hard-surfaced roads was considerable, especially in the direction of Arundel. About three-fifths of the loss in the Meridian section is represented by damage to buildings, highways, and bridges.

Damage in the Chickasawhay Valley.—The crest stage reached at Enterprise was 37 feet, at 1 a. m. of the 10th, or 1 foot below the record stage. On the night of the 8th, the merchants began to elevate their stocks of goods to levels above average high water, but in spite of these precautions much damage was done to merchandise in storehouses.

The rise at Shubuta was 11.4 feet during the night of the 8th to a stage of 33 feet at 7 a. m. of the 9th, and at 1 p. m. of the 11th a crest stage of 44.3 feet was reached. As it was impossible, after 7 a. m. of the 9th, to reach the bridge upon which the river gage is located, the crest reading was derived by comparison with the record water mark of 45 feet, in April, 1900, the recent stage being about 8 inches lower.

Great damage occurred in the districts between Enterprise and Shubuta. Most of the inhabitants of lowlands suffered severely, somewhat more than 200 families, chiefly colored, near Shubuta, being obliged to abandon their homes, which were flooded to depths ranging from 3 to 4 feet for about two days. These families lost nearly all of their corn, peas, potatoes, and live stock, in addition to damage to household effects. It appears that the greater portion of the losses could have been avoided had the sufferers heeded the warnings, which were two days in advance of the flood. The river observer at Shubuta states that, "still with all the warnings they would not believe that it would be as it proved to be."

Railroad washouts were numerous along the Chickasawhay. In some instances from 300 to 500 feet of road-bed were undermined. Traffic was suspended for two days and complete resumption was not accomplished for nearly 10 days after the water receded. The Mobile & Ohio Railroad Co., by "tying" its tracks at critical points, avoided the disaster of April, 1900, when their tracks were hurled into the woods for much of the distance from Meridian southward.

From Shubuta southward, the damage was less severe than in Clarke County, but there was a heavy loss of live stock and lumber, and great damage to roads, creek bridges, and fences.

Leaf River district.—The Leaf River, at Hattiesburg, reached a crest stage of 25.3 feet on the 11th, the highest since regular readings began. The loss by overflow and backwater at Hattiesburg and adjacent localities was probably greater than in any other section of equal area.

The inundated area averaged eight blocks from the river in the northern and eastern sections of the city, dwellings being flooded from 2 to 3 feet deep. In the sections occupied largely by Negroes, about 400 families were compelled to abandon their homes. The number of refugees was approximately 1,000; these were cared for by public relief associations. Three persons are known to have lost their lives by drowning.

Nearly every factory in the district suffered losses ranging from \$500 to \$35,000, the principal product damaged being dry lumber, and there was also considerable loss through suspension of business. Below Hattiesburg the chief losses were due to drowning of live stock, the washing away of logging roads, bridges, and portions of highways.

In Jones County all railroads were washed badly, suspending traffic for two or three days. Near Laurel many families had to abandon their homes, and some residents had narrow escapes from drowning.

Two railroad wrecks, due to washouts, occurred on the Mississippi Central, the first one on the 8th, about 2 miles west of Hattiesburg, where the engine was derailed, killing the engineer instantly. The second wreck was on the 9th, near Prentiss, where an extra freight train went through a trestle that had been damaged by high water. The fireman was buried under the locomotive.

Pascagoula River district.—At Merrill, at the head of the Pascagoula River, there was a rise of 7.8 feet, on the 8th, to 20.5 feet, on the 13th, when the flood waters from the Chickasawhay and Leaf Rivers began to arrive. On the 15th, a crest stage of 25.5 feet was reached. This is the highest stage since the record of 27 feet on July 9, 1916.

In Greene, George, and Jackson Counties, more than 1,000 head of cattle were drowned and the lumbering industry was stopped.

Pearl River district.—The rainfall over the watershed of the Pearl River above Jackson was much less than it was over the districts below Jackson and in the eastern portion of the State. A crest of 23.3 feet was reached at Edinburg, on the 12th, and 30.5 feet, at Jackson, on the 17th. In the Pearl River valley north of the Alabama & Vicksburg Railroad the losses by overflow were generally unavoidable and not unusual. The greater losses were due to freshets in the creeks tributary to the main stream. Small bridges were dislodged and logging roads washed out, but there was no material damage done to improved highways. Railroads in this section suffered little.

From Jackson south nearly to the line of the Mississippi Central Railroad there was no extraordinary overflow, although truck crops at Crystal Springs were damaged considerably.

In the counties of Lincoln, Lawrence, Marion, and Pearl River, the water stages were nearly equal to those reached in the historic flood of April, 1900. A large number of both wooden and steel bridges were dislodged, and for the first time since April, 1896, the tracks of the Illinois Central Railroad Co., near Bogue Chitto, Miss., were submerged for a distance of 3 to 4 miles. Considerable damage was done to recently constructed gravel roads in Lincoln County. It is also reported that the loss by erosion in the counties named was extensive and probably will cause the abandonment of large cultivated areas. About 500 acres of oats were flooded.

The West Pearl River.—In the county of Walthall, Miss., and in the parishes of Washington and St. Tam-

many, La., which are traversed by Bogue Chitto River, great damage was sustained to highways and sawmills. The loss of livestock was probably the greatest of the last 20 years.

In addition to the heavy loss of live stock in the West Pearl bottoms, there was extensive damage to logging roads. The probable loss of many logging teams was prevented by their timely withdrawal.

Estimated loss due to floods, December, 1919.

Rivers of—	Tangible property, bridges, roads, etc.	Crops.		Live stock and other farm property.	Suspension of business.
		Gathered.	Prospective.		
Mississippi (southeast).....	\$435,000			\$144,000	\$104,900
Alabama.....	1,637,600	\$638,000	\$32,100	82,150	22,500
Georgia.....	2,000,000			760	760
South Carolina.....					
Total.....	4,072,600	638,000	32,100	226,910	128,160

Flood stages, December, 1919.

Drainage, river, and station.	Flood stage.	Above flood stages—dates.		Crest.	
		From—	To—	Stage.	Date.
ATLANTIC DRAINAGE.					
Santee:	<i>Feet.</i>			<i>Feet.</i>	
Rimini, S. C.....	12	11	21	15.2	16
Ferguson, S. C.....	12	13	23	13.7	17, 18
Saluda:					
Chappells, S. C.....	14	9	14	19.5	12
Pelzer, S. C.....	7	10	11	14.0	9
Savannah:					
Calhoun Falls, S. C.....	15	11	11	15.0	11
Augusta, Ga.....	32	10	12	35.4	11
Broad:					
Carlton, Ga.....	11	9	11	28.0	10
Oconee:					
Millersville, Ga.....	22	10	13	31.4	12
Dublin, Ga.....	22	15	16	24.0	15
Ocmulgee:					
Macon, Ga.....	18	10	13	25.3	11
Hawkinsville, Ga.....	29	15	15	29.3	15
Abbeville, Ga.....	11	15	22	16.5	17
Lumber City, Ga.....	15	20	22	16.5	21
EAST GULF DRAINAGE.					
Flint:					
Woodbury, Ga.....	10	10	13	17.1	11
Albany, Ga.....	20	16	19	24.2	17
Chattahoochee:					
Norcross, Ga.....	16	10	11	27.1	10
West Point, Ga.....	20	9	?	29.3	10
Columbus, Ga.....	20	?	?	52.0	10
Eufaula, Ala.....	40	11	16	53.4	14
Alaga, Ala.....	30	11	17	40.7	14
Alabama:					
Montgomery, Ala.....	35	10	18	57.1	11
Selma, Ala.....	35	10	20	55.9	14
Talapoosa:					
Millstead, Ala.....	40	10	12	54.0	10
Coosa:					
Rome, Ga.....	30	11	11	32.8	11
Gadsden, Ala.....	22	14	16	22.8	15, 16
Lock No. 4, Lincoln, Ala.....	17	10	17	18.3	11
Wetumpka, Ala.....	45	10	14	55.6	12
Etowah:					
Canton, Ga.....	11	9	11	24.3	10
Cahaba:					
Centerville.....	25	9	11	32.8	
Tombigbee:					
Aberdeen, Miss.....	33	3	3	33.0	3
Demopolis, Ala.....	39	9	24	58.1	6
Black Warrior:					
Tuscaloosa, Ala.....	46	9	12	56.6	10
Pascagoula:					
Merrill, Miss.....	20	13	20	25.5	15
Chickasawhay:					
Enterprise, Miss.....	21	9	12	36.2	10
Shubuta, Miss.....	27	9	16	44.3	12
Leaf:					
Hattiesburg, Miss.....	19	10	13	25.3	11
Pearl:					
Edinburg, Miss.....	20	11	15	23.3	17
Jackson, Miss.....	20	9	27	30.5	12
Columbia, Miss.....	18	9	28	25.6	12
West Pearl:					
Pearl River, La.....	13	13	(1)	16.3	13

¹ Continued into January.

Flood stages, December, 1919—Continued.

Drainage, river, and station.	Flood stage.	Above flood stages—dates.		Crest.	
		From—	To—	Stage.	Date.
OHIO DRAINAGE.					
Little Kanawha:	<i>Feet.</i>			<i>Feet.</i>	
Glenville, W. Va.....	22	7	7	23.9	7
Ohio:					
Cloversport, Ky.....	40	11	19	44.8	14, 15
Henderson, Ky.....	33	1	23	40.4	16, 17
Evansville, Ind.....	35	1	23	42.3	16, 17
Mount Vernon, Ind.....	35	3	24	41.5	18
Shawneetown, Ill.....	35	3	24	42.1	18, 19
Scioto:					
Circleville, Ohio.....	7	1	1	8.5	1
Licking:					
Farmers, Ky.....	25	7	7	25.0	7
South Fork of Licking:					
Cynthiana, Ky.....	20	7	7	21.0	7
Green:					
Lock No. 4, Woodbury, Ky.....	33	(1)	3	39.5	1
Do.....	33	9	19	39.5	17
Lock No. 2, Rumsey, Ky.....	34	(1)	25	40.7	20
Wabash:					
Lafayette, Ind.....	11	1	1	11.7	1
Mount Carmel, Ill.....	15	4	7	15.8	5
North Fork of Holston:					
Mendota, Va.....	8	14	14	10.5	14
Tennessee:					
Riverton, Ala.....	32	15	15	32.3	15
MISSISSIPPI AND GULF DRAINAGE.					
St. Francis:					
Marked Tree, Ark.....	17	(1)	27	17.6	15-21
Mississippi:					
Arkansas City, Ark.....	42	13	(*)	44.3	27, 28
Yazoo:					
Yazoo City, Miss.....	25	15	(*)	27.7	30, 31
Tallahatchie:					
Swan Lake, Miss.....	25	4	(*)	28.7	15-16
Atchafalaya:					
Melville, La.....	37	27	(*)	37.1	30, 31
Black:					
Black Rock, Ark.....	14	(1)	5	16.6	1
Cache:					
Jelks, Ark.....	9	(1)	26	10.3	14, 15
Sulphur:					
Finley, Tex.....	24	3	6	25.0	4
Ringo Crossing, Tex.....	30	(1)	4	21.8	1
Trinity:					
Liberty, Tex.....	25	(1)	6	28.2	30, No. 2
Dallas, Tex.....	25	(1)	2	34.2	* 30
Trinidad, Tex.....	28	1	9	34.6	6

* Continued from November.

* Continued into January.

* November.

Flood stages, December, 1919—Continued.

Drainage, river and station.	Flood stage.	Above flood stages—dates.		Crest.	
		From—	To—	Stage.	Date.
MISSISSIPPI AND GULF DRAINAGE—Continued.					
Sabine:	<i>Feet.</i>			<i>Feet.</i>	
Bon Weir, Tex.....	20	11	15	20.2	13, 14
PACIFIC DRAINAGE.					
Gila:					
Kelvin, Ariz.....	5	5	8	10.0	5
Willamette:					
Eugene, Oreg.....	10	11	11	12.0	11
Oregon City, Oreg.....	10	22	27	10.8	22

MEAN LAKE LEVELS DURING DECEMBER, 1919.

By UNITED STATES LAKE SURVEY.

[Dated Detroit, Mich., Jan. 6, 1920.]

The following data are reported in the "Notice to Mariners" of the above date:

Data.	Lakes. ¹			
	Superior.	Michigan and Huron.	Erie.	Ontario.
Mean level during December, 1919:	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>
Above mean sea level at New York.....	602.33	591.18	571.81	245.74
Above or below—				
Mean stage of November, 1919.....	-0.18	-0.25	-0.43	-0.37
Mean stage of December, 1918.....	-0.12	-0.85	-0.38	-0.15
Average stage for December, last 10 years.....	+0.03	+0.08	+0.12	+0.33
Highest recorded December stage.....	-0.80	-2.40	-1.72	-1.87
Lowest recorded December stage.....	+1.13	+1.18	+0.95	+2.31
Average relation of the December level to—				
November level.....	-0.2	-0.2	-0.1	-0.2
January level.....	+0.2	+0.2	+0.1	+0.0

¹ Lake St. Clair's level: In December, 574.62 feet.